

skin, skull, and lower jaw now in the Natural History Museum, London. The type of *Okapia Johnstoni*, Selater, namely the two pieces of skin ("bandoliers") from the hind limbs, is also preserved in this Museum.

Certainty as to the distinctness of these two species and a complete diagnosis of their characters, if they should prove to be, as now supposed, distinct, can only be based on the examination of a large series of specimens.

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#### BIBLIOGRAPHICAL NOTICES.

*Palæontologia Indica*. New Series. Vol. I. Part 3. *Fauna of the Miocene Beds of Burma*. By FRITZ NOETLING, Ph.D., F.G.S., Palæontologist, Geological Survey of India. Folio. 378 pages, 25 plates. Calcutta: Geol. Survey Office. London: Kegan Paul & Co. 1901.

THE author explains that the fossils here described, besides including those collected by himself from the Irrawadi series and other beds, comprise some collected by the late Mr. Grimes and others by Messrs. Theobald and Fedden in Lower Burma some thirty years ago. He found that the want of any reliable literature on Burmese palæontology was not relieved by any of the published works on Indian fossils. The corals and echinoids are too rare in Burma for Duncan and Sladen's monographs on those of Western India to be of service, and Sowerby's descriptions of Cutch fossils are not sufficiently distinct. The memoir on the fossils of the Nummulitic group of Sind by d'Archiac and Haime he found to be "worse than useless," the fossils of different formations being confused. The type fossils require to be revised and carefully compared with others of authenticated horizons.

Martin's 'Tertiärschichten auf Java,' however, has been of great use to him; and, following Stoliczka's suggestion that the fauna of the Burmese Tertiary System should be compared with the living fauna of the Indian Ocean, F. Noetling has been able, thanks to Major Alcock, to study the great collection in the Indian Museum with highly satisfactory results.

Thus a new line of research has been opened out in the study of the Indian Tertiary System, affording some highly interesting "views regarding not only the origin of the recent fauna of the Indian Ocean, but also of the relation the Miocene of India-Burma had with the older Tertiary System of Europe and the recent fauna of the Western Pacific. In fact, I think that one of the most important of my results," says Mr. Noetling, "is the proof of a migration of species from Europe in an eastern direction, which commenced with the Eocene and probably lasted through the Miocene—a migration which still continued in an eastern direction during the Miocene

period in India-Burma, though all direct communication between the Miocene Ocean of Europe and India was disconnected during the Miocene period."

In subdividing the Tertiary System of Burma the author finds that the Upper or Irrawaddi (Pliocene) Series contains the remains of land and freshwater (fluvial) life, and is based on a conglomerate containing numerous fossil bones, such as those of *Hippotherium* and *Acerotherium*.

(It was on an exposed ledge of this conglomerate that Mr. Noetling discovered, in association with a fossil tooth of *Hippotherium antelopinum*, the stone implement described in 'Natural Science,' vol. x. no. 62, p. 234, 1897.)

The Lower or Arrakan (Miocene) Series in its subdivisions comprehends:—(1) The Upper or Pegu division (Miocene), no Nummulites; (2) The Middle or Bassein division, with Nummulites (Eocene); (3) The Lower or Chin division, without Nummulites (Eocene or Cretaceous?). It is noted that the geology and fossils of the Pegu division have been best known and that those of the Bassein and Chin divisions have not been so closely collected and studied. The Pegu division comprises:—(1) The Yenangyoungian beds, marine, largely littoral, and partly estuarine; and (2) The Promean, of estuarine origin, with its petroleiferous strata.

The description and correlation of the formations and their zones in Lower Burma (pages 17-26) and in Upper Burma (pages 27-38) are followed by tables of the vertical and zonal distribution of the fossil molluscan fauna (pages 19-53). Two hundred and eight species, including some varieties, besides indeterminate forms, are described at pages 101-378.

The relationships of wide territorial types, namely, (1) the Gallic, Pacific, and Mediterranean groups of Palæogene species, and (2) the Identical, Subidentical, and Evolutionary Neogene species (page 98), are defined, and their proportions stated.

The proofs are given of an Eastern migration of European species, assumed by the late H. M. Jenkins in 1864 to have proceeded in Miocene times, but by F. Noetling (in the work before us) as having been in the Eocene period. This extensive subject is carefully and philosophically treated at pages 39-100, and elucidated with elaborate successional and statistical tables.

Noetling agrees with Martin that there is no evidence to warrant the adoption of "Oligocene" for any part of the Indian Tertiary System resting on that regarded as Eocene, whether in Baluchistan, Western India, Burma, Java, Sumatra, or Borneo.

*Biologia Centrali-Americana.—Hemiptera-Heteroptera.* Vol. II. By G. C. CHAMPION. Pp. xvi & 416. With 22 plates. London, 1897-1901.

THE first part of this work, comprising the families Pentatomidæ, Coreidæ, Lygæidæ, Pyrrhocoridæ, and Capsidæ, and elaborated by Mr. Distant, was finished in 1893. The remaining nineteen families of the Heteroptera are worked out by Mr. Champion in the present